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INFORMATION REPORT

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COUNTRY USSR

SUBJECT
The Wage System And Production Input Factors Of The Soviet Ministry Of The Electro-technical Industry, Including Information On Other Machine-building Industries.

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SUBJECT I. WAGES: SUBJECT II. PRODUCTIVE FACTOR 50X1-HUM

RELATIONSHIP

SUBJECT I. WAGES

The existing tariff system in the Soviet Union is composed of the following elements.

1. Tariff qualifications handbook.
2. Tariff index.
3. Tariff rates.

The tariff qualifications handbook contains brief characteristics of all types of work that are encountered in a given field or factory.

The handbook gives the requirements for technical and general knowledge for a worker of given qualifications.

On the basis of the tariff qualifications handbook the categories of work and categories of workers are determined.

The tariff index gives the difference in pay, depending on the category which is determined according to the tariff qualifications Handbook.

The tariff index consists of:

(a) tariff categories

(b) tariff coefficients

The coefficient of the first category of the tariff scale is equal to one; the coefficient of each of the following categories shows how much greater the pay for work in the given category is than for work in the first category.

Tariff rates are established for the first category. The tariff rates for the remaining categories of the tariff scale are determined with the aid of the tariff coefficient, by multiplying scales of the first category by the appropriate coefficient. Differentiations are established in the tariff indexes for each enterprise depending on the following factors:

(a) the wage system;

(b) work conditions;

(c) economic significance of the given branch, enterprise, shop, production section and even of an individual profession;

(d) the remoteness of the location of the enterprise.

These factors have the following significance.

(a) The various wage rates of the first category are established depending on the wage system;

Example: Higher rates are usually established for piece-workers than for workers who are paid by unit of time.

(b) Working conditions are taken into account in that work under conditions of excessive heat, unhealthy work, and heavy labor are given higher tariff rates than work performed under normal conditions. Sometimes a shorter working day, additional leave, or the distribution of milk, fats, etc is established for such types of work;

(c) Higher tariff rates are established for the leading branches of industry such as petroleum, coal, metallurgical, and machine building industries;

(d) Higher rates and a number of privileges, a part of which have been taken away, are established for workers of remote areas such as the Far North, the Urals, Siberia, and the Far East.

Taking into account the factors enumerated above, it can be concluded that even though it has a single index, an enterprise can have

several tariff rates, differentiated as indicated above.

The tariff system in use at the present time in the Soviet Union is completely antiquated and confused as a result of various decrees of the party and the government.

For example in 1945, when the rationing system was abolished, additional bread was allocated and was included in the tariff rates. This measure led to a multiplicity of tariff indexes and rates. (In 1939 there had been a tariff reform as a result of which a single tariff index had been created for the enterprise of a given branch of industry.)

Beginning with 16 September 1946, in connection with the raising of prices on rationed food products, food rations were added to the wages of workers and employees.

These additions to the wages were included in the tariff indexes and resulted in an increase of the tariff rates and piecework rates.

These additions led to a multiplicity of tariff indexes. As many indexes sprang up in the enterprises as there had been tariff rates of the first category prior to the addition of food rations.

In addition these measurements led to the lowering of the quality of the tariff indexes because of the lowering of the gap between tariff rates of adjacent categories.

Tariff Rates

In the Electrical Industry there are the following 4 basic hourly tariff rates in the first category:

1. for piece-workers;

2. for time workers;

3. for piece-workers engaged in heavy labor and work under conditions of excessive heat;

4. for time workers engaged in heavy labor and work under conditions of excessive heat.

The hourly tariff rates of the first category are approved by the Council of Ministers USSR for each enterprise.

The scale of the hourly tariff rates is established in accordance with the significance and importance of production for the economy, and with the location of the enterprise. Therefore in the Ministry of the Electrical Industry there are a great number of different hourly tariff rates of the first category, and also tariff indexes.

Each enterprise of the Ministry of the Electrical Industry has several tariff indexes and tariff rates of the first category.

Until 1941 the following tariff index was in effect in the electrical industry:

Categories	1	2	3	4	5	6	7	8
Tariff Coefficients	1.0	1.2	1.45	1.75	2.10	2.50	3.0	3.6

After the reform of the tariff system which took place in 1946 in connection with the raising of prices of food products, this index was altered and in its place were introduced several other tariff indexes.

For example: the following tariff index has been in effect since 16 September 1946 for piece-workers engaged in low temperature work [kholodnyye raboty] in the Kharkov Electromechanical Plant:

Categories	1	2	3	4	5	6	7	8
Tariff Coefficients	1.0	1.12	1.28	1.46	1.64	1.88	2.15	2.51

The following tariff rates of the first category are in use at this plant:

1. for piece-workers 133 kopeks
2. for time workers 127.1 kopeks
3. for piece-workers engaged in heavy labor and work under conditions of excessive heat 143 kopeks
4. for time workers engaged in heavy labor and work under conditions of excessive heat 133 kopeks

(Borokh, Normirovaniye truda i zarabotnoy platy v elektrotekhnicheskoy promyshlennosti [Standardization of Labor and Wages in the Electrotechnical Industry] page 190, Library No TK 85 B6.)

Wage Systems

There are 2 basic types of labor payments in the plants of the Ministry of the Electrotechnical Industry:

(a) piece-work payments;

(b) time payments.

The piece-work type of labor payments includes the following systems:

1. straight piece-work system (individual and brigade);
2. progressive piece-work;
3. indirect piece-work.

The time payments of labor include the following systems:

1. the time system;

2. time-bonus system.

Piece-work wages are the basic system of payment of labor in the Soviet Union. Sixty to 70% of all industrial workers are paid by that system.

The piece-work system of payment of labor is based on the so-called tariff system and on the numerous payments added to the tariff. The tariff system was introduced about 20 years ago and, in effect, has not been subject to great changes.

During this time there were insignificant changes in the tariff rates of the first category and the tariff indexes were changed several times.

Workers' wages have increased due to the increase in prices of consumer goods and as a consequence of the growth of the productivity of labor. The increase in the workers' wages did not come in the form of increased hourly tariff rates, but in the form of various supplementary payments, such as the progressive bonus system, various premiums for higher quality of production, premiums for fulfilling orders ahead of schedule, premiums for overfulfillment of the production program, etc. As a result of such premium payments, the tariff system lost its significance as the regulating stimulus of the increase of the productivity of labor because it accumulated all types of additional payments and began to account for 40 to 55% of the basic wages of workers, as against 95-98% in the 1930's.

Since the tariff system ceased being the basic regulator of wages, Soviet enterprises ceased to be concerned with evaluating the quality of the piece-work norms of output.

For 80-90% of the jobs in all enterprises there are output norms statistically based on experience [opytno-staticheskiye], i.e., output norms derived from work experience in a previous time period. The norms statistically based on experience can regulate neither wages nor the productivity of labor since they have great reserves of time. The Soviet government tried to raise the productivity of labor by means of yearly increases of the output norms and lowering of the piece-work rates, but these measures did not produce the required results since the enterprises tried to maintain the former level of wages both by various additions to the tariff earnings and by use of the reserves of time in the norms statistically based on experience.

As a result of this the piece-work system of wages in the Soviet Union became so confused that it became a subject of discussion at the Twentieth Congress of the KPSS [Kommunisticheskaya partiya Sovetskogo Soyuza -- Communist Party of the Soviet Union].

1. In the straight individual piece-work system of payment, the wages of a worker increase in proportion to the growth of his output, i.e., the daily earnings of a worker are equal to the rate multiplied by his actual output for the day.

The earnings of a worker under the piece-work system are determined in the following manner.

The daily earnings equal the rate multiplied by his actual output for the day.

Let us suppose: the rate per piece is one ruble;
the daily tariff is 10 rubles.

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the daily tariff is 10 rubles.

By having an 8-hour output of 12 pieces as opposed to the norm of 10 pieces, according to the piece-work rates the worker's daily earnings would be equal to one ruble times 12 or 12 rubles. That is, his earnings increased 20% over the tariff. In this case the percentage of fulfillment of the output norms would be $\frac{12 \times 100}{10}$ or 120%.
The brigade piece-work system is used only in those types of work where collective fulfillment is required.

The application of this system to production is extremely limited. It actually is used in forge shops, in moulding work, in large castings, in foundry shops, in assembly, and in major and intermediate repairs of the mechanical equipment of a plant.

The wages of each member of the brigade depend on the results of the work of the entire brigade. The calculation of the wages of the members of the brigade is made in proportion to the tariff rates and the amount of time each member of the brigade has worked.

2. The progressive piece-work system of payment. This system is distinguished from the simple piece-work system of labor in that payment for the worker's entire output is made in accordance with not one, but several rates which progressively increase in proportion to the degree of overfulfillment of the established output norms.

The worker is paid at the normal rate for output within the limits of the norm, but for output above the norm he is paid at a higher rate. The greater the percentage his overfulfillment of the norms is, the higher the rate at which he is paid.

In the plants of the Ministry of the Electrotechnical Industry the following scale is used for calculating the extra payments at progressively increasing rates when the output norms are overfulfilled.

Work above the established base for calculating overtime pay (above the established norms for overtime work) or above the average actual output in %	Increase of the basic piecework rate in %: General scale	Scale for metallurgical units
1	2	3
from 1 to 10	30	50
from 11 to 25	50	100
from 26 to 40	75	200
from 41 up	100	200

The calculation is performed in accordance with these scales in approximately the following manner.

Let us suppose that a worker whose output norm is 100 articles per month and who is paid at the rate of 6 rubles per unit, produces 130 articles, overfulfilling the plan by 30%. He would be paid for all the 130 articles in accordance with the straightforward piecework system of pay: 130x6 or 780 rubles. In addition, he would be paid for 30 articles, in accordance with the progressive piecework system of payment, an increment equal to 75% of the basic rate: 30x6x0.75 or 135 rubles.

His total earnings would be 780 rubles plus 135 rubles or 915 rubles.

(Borok, Tekhnicheskoye normirovaniye i zarabotnaya plata v elektropromyshlennosti [Technical Standardization and Wages in the Electrical Industry], page 206, Library No TK 85 B6.)

The indirect piecework system is mainly used when paying for the labor of subsidiary workers engaged in maintenance work in production areas. Under this system a worker's wages are also determined by the

piecework rates in accordance with the hourly tariff rate and the output norms of the basic workers serviced by them, depending on the degree of overfulfillment of the norm. The total amount by which the norm is overfulfilled is not used as a basis for calculation, but rather a fixed coefficient which may be 0.3, 0.4, 0.9, etc, but not higher than 1.0.

For example one subsidiary worker, an adjuster, services a group of machines which produce certain components. The daily output norm of a given component for the whole group of machines serviced by him is 1,000 pieces. The daily tariff rate of an adjuster is 14 rubles. The adjuster's rate in the given case would be $\frac{14 \times 100}{1,000}$ or 1.4 kopeks.

The time system is used for workers whose work does not lend itself to the establishing of norms. To this category usually belong electricians, fitters and plumbers on general duty, adjusters in stamping and mechanical shops, inspectors in the technical control section, maids, subsidiary workers, storekeepers, tool distributors, stokers, crane operators, sharpeners [stropal'shchiki], grease men, harness makers, etc.

Usually the time system is used in conjunction with bonuses established for the fulfillment of concrete work indexes. For example fitters are paid bonuses for decreasing the amount of time that an equipment stands idle during planned repairs as compared with the established norms for conditions during the fulfillment of the plan for repair of equipment.

The bonuses are paid according to the following scale:

1. for completing the repair of equipment within the time limits indicated by the schedule; 20%

2. for improving the quality of repair work; 10%

3. for overfulfillment of the repair plan the repair man is given a bonus of 1% for each percent of overfulfillment. (These data are derived from personal experience.) Electricians on duty are paid a bonus amounting to 20% of their monthly pay for the absence of demurrage and accidents. (Data derived from personal experience.)

Bonuses amounting to 20% of their monthly earnings are paid to plumbers on duty and ventilation repairmen for servicing without accidents all plumbing and ventilation equipment.

The conditions for awarding bonuses to time workers are worked out and approved by the chief directorate of the ministry.

The director of the plant makes a copy of the ministry's standard instructions on awarding bonuses to time workers and formally approves them for the plant. The size of the bonus to be given is approved by the head of the shop.

Pay for teaching new workers in the enterprises of the Ministry of the Electrotechnical Industry is given in the following amounts.

Duration of Instruction [1]	Low-Temperature Work [2]	Work under Conditions of Excessive Heat in Unhealthy Conditions [3]
	Individual Instruction	
1 month	up to 70	up to 100
2 months	up to 140	up to 200
3 months	up to 225	up to 375
4 months	up to 300	up to 500
5 months	up to 400	up to 750
6 months	up to 500	up to 900

[1]	[2]	[3]
	Brigade Instruction	
1 month	up to 20	up to 35
2 months	up to 40	up to 70
3 months	up to 75	up to 135
4 months	up to 100	up to 180

(Organizatsiya truda i zarabotnoy platy na mashinostroitel'nom zavode [Organization of Labor and Wages in a Machine-Building Factory] TJ 1135 V6, 1955, Mashgiz, page 182)

Payment Procedures During Stoppages

When the stoppage is the fault of the worker, he is not paid during the period of the stoppage.

When the stoppage is not the fault of the worker, he is paid at one half the tariff rate of a time worker in the corresponding category.

1. Decree of the TsIK [Tsentral'nyy ispolnitel'nyy komitet -- Central Executive Committee] and the SNK [Sovet narodnykh komissarov -- Council of People's Commissars] of the USSR, 30 December 1931.

2. Decree of the NKT [Narodnyy komissariat truda -- People's Commissariat of Labor] of the USSR, 25 February 1932.

3. I. I. Voronkov, Organizatsiya truda i zarabotnoy platy na mashinostroitel'nom zavode, TJ 1135 V6, 1955, Mashgiz, page 183

Payment for Defective Production

(a) When the defective production is the fault of the worker. Production that is completely unacceptable is not paid for at all. Partially defective production is paid for at a lower rate.

Depending on to what degree the production is acceptable, the administration determines the amount of pay, which is not to exceed one-half of the tariff rate. In several cases a deduction is made from the worker's wages amounting to as much as 2/3 of his average monthly earnings.

If the worker deliberately ruined the material, 5 times the cost of the resulting loss is exacted from him.

(b) When the defective production is not the fault of the worker. Produce that is completely unacceptable is paid for at 2/3 the tariff rate of a time worker in the corresponding category.

Production that is partially defective is paid for at lower rates, depending on the degree to which the production is acceptable.

The pay must not be lower than 2/3 of the tariff rate of a time worker in the corresponding category.

1. Decree of the NKT, 25 February 1932.

2. Instructions of the NKT, 1 June 1932.

3. I. I. Voronkov, Organizatsiya truda i zarabotnoy platy na mashinostroitel'nom zavode, TJ 1135 V6, 1955, Mashgiz, page 185.

Payment for Overtime

In those enterprises where different rates have been introduced for time workers and piece-workers, overtime pay is in all cases based on the tariff rate of the time worker of the appropriate category. (Decree of the NKT, 8 April 1932, Izvestiya NKT SSSR [News of the NKT, USSR] No 16, 1932.)

A time worker is paid 1 1/2 times the hourly tariff rate for each

of the first 2 hours of overtime, and twice the hourly tariff rate for succeeding hours of overtime.

Piece-workers, in addition to their usual earnings, are given the following additional amounts for overtime work.

For each of the first 2 hours of overtime one half of the hourly tariff rate of the assumed time worker's category, and the full hourly tariff rate for each succeeding hour of overtime.

Pay for night work. Night work is considered the period from 10 pm to 6 am (KZoT [Kodeks zakonor o trude -- Labor Law Code], page 96.)

When an enterprise works in 3 shifts, the length of the third shift, the night shift, has been established as not 8 hours, but 7 hours. (Spravochnik profsoyuznogo rabotnika [Handbook of the Trade Union Worker], page 182.)

A time worker who works a 7 or 8-hour night shift is paid for each hour at 8/7 the rate of a day worker, and those who work a 6-hour shift at 6/5 of the daytime rate.

A piece-worker who does night work is paid, in addition to his usual earnings, 1/7 of the hourly rate for each hour of night work if he works on a 7 or 8 hour shift, or 1/5 of the hourly rate of his category if he is on a 6 hour shift (KZOT RSFSR, page 96).

Pay for work on holidays. Work on holidays (May 1, November 7 and 8, December 5, and January 1) is given double pay in the following manner:

Piecework -- at twice the piecework rates;

Time work -- double the tariff rates.

(Article 7 of a decree of the SNK USSR, 24 September 1929.)

(Article 1 of a decree of the NKT USSR, 9 February 1930.)

Calculation of the Average Worker's Pay

In the Soviet Union there are many methods for calculating the average worker's pay. However all these methods are based on data reported for past periods and on plan data for future periods. It is not possible to use such methods in calculating the pay of the average worker in the USSR because Soviet statistics do not publish data on wages. Consequently under these conditions only approximate estimates can be made by using various mean quantities.

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[redacted] several ways of calculating the average worker's pay. Data for the calculations are for the Moscow plant imeni Vladimir Il'yich of the Ministry of Electrical Industry.

In the periodical Sotsialisticheskiy Trud [Socialist Labor], No 10, 1956, pages 10-14, are published data on the introduction of new tariff conditions, on the percentage of overfulfillment of output norms by basic production shops, and on the average categories of work.

The plant imeni Vladimir Il'yich is a typical machine-building plant of the Ministry of the Electrotechnical Industry [sic].

First it is necessary to define the following terms and concepts:

1. the hourly wage fund;
2. the daily wage fund;
3. the monthly wage fund.

The hourly wage fund includes the following.

(a) Pay for hourly work and overtime work actually performed according to the tariff rates and piecework rates, including additional payments for difficult work conditions.

(b) Additional payments in accordance with the progressive piecework pay system.

(c) Additional payments to piece-workers for altering their normal work conditions.

(d) Bonuses for time workers and piece-workers.

(e) Additional payments to brigade leaders, who are prisoners [neosvobozhdennyy], for leading brigade work.

(f) Additional payments for night work.

(g) Additional payments for teaching inexperienced production workers.

(h) Payment for stoppages which were not the worker's fault.

2. The daily wage fund includes the totals of the hourly wage fund, and in addition includes the following: payment for hours of ordinary stoppage, payment for hours during which the worker was diverted to carry out state and social obligations, payment for time off women receive to nurse their babies, additional payments to minors for the shortened working day.

3. The monthly wage fund includes the totals of the daily wage fund, and also includes the following: payment for stoppages lasting a whole day and for workers' absences that last a whole day, additional payments for prolonged service, pay for leaves, discharge pay, additional group payments [kommunal'nyye nadbavki], money for lodgings.

In determining the real fund of working time it is necessary to distinguish between:

(a) The calendar fund of working time, which is equal to the number of calendar days in a given plan period (there are 365 or 366 days in a year).

(b) The nominal fund of working time, which is equal to the calendar fund minus nonworking days such as holidays and days off.

For example if the calendar fund during a year is 365 days and the work week is 7 days, the nominal fund of working time is 307 days (365 days minus 52 days for off-days and 6 holidays and nonworking days, if they do not coincide with the off-days).

(c) The real fund of working time is equal to the nominal fund minus unavoidable losses of time such as the following: losses due to the occurrence of regular annual leave, maternity leave for women, losses in connection with illness and social obligations.

These losses are usually planned by taking account of data for the preceding period.

In the Ministry of the Electrotechnical Industry the computation of the working time spent by one worker is made in the following manner.

Indexes	Average time for one worker			
	for the accounting period		for the planned period	
	days	%	days	%
[1]	[2]	[3]	[4]	[5]
Nominal fund of working time	307	100	307	100
Losses of working time				
Due to regular annual leave	15.35	5.0	15.35	5.0
Due to maternity leave	3.07	1.0	3.68	1.2

[1]	[2]	[3]	[4]	[5]
Due to illness	13.81	4.5	12.28	4.0
Due to carrying out of state and public duties	3.07	1.0	3.07	1.0
Other losses	2.46	0.8	-	-
Total of losses	37.76	12.3	34.38	11.2
Real fund of working time	269.24	-	272.62	-

The above data for computing the real fund of working time are valid for all active enterprises with a stable working force.

V. I. Borokh, Tekhnicheskoye normirovaniye i zarabotnaya plata v elektropromyshlennosti, TK 85 B6, page 206.

For the calculation of the average wages in the plant imeni Vladimir Il'yich the tariff scale and the tariff rates of the first category of the Ministry of the Electrical Industry given on page 90 of V. I. Borokh's book were used.

The number of pieceworkers in the shops is estimated. Time workers constitute 23% of the workers in that plant. The average category of labor and the data on overtime work above the output norms are taken from the periodical Sotsialisticheskiy Trud, No 10, 1956, pages 10-14.

In our example we took for the calculation of the average wages 1,560 pieceworkers in basic production shops. The number of time workers is 363.

In September 1956 bonuses to time workers amounted to 19.5%.

Calculation of the average wages for the plant imeni Vladimir Il'yich of the Ministry of the Electrical Industry for September 1956.

	average category of labor	tariff rate for first category	number of piece-workers	man-hours of piece-work	Hourly fund (rubles)	Wages including piecework Total No of rubles	tariff rubles included	progressive piecework total No of rubles	% of piece-work earnings	average rubles per hour	wages rubles per month (195 hours)	fulfillment of the norms for work hours	share of the tariff in the average monthly wag
3	4	5	6	7	8	9	10	11	12	13	14	15	16
a) moulding						146634							
b) pivotal [sterzhnevoy]	4.5	1.43	180	31446	151032		69495	4398	3	4.80	936	211	0.46
tamping	5	1.43	30	5241	25893	25386	12264	507	2	4.93	962	207	0.47
eating	5	1.43	50	8735	42735	42104	20439	631	1.5	4.89	955	206	0.47
echanical processing of components of lectric motors	4.5	1.33	250	43675	204940	200922	92591	4018	2	4.68	914	217	0.45
echanical processing of intermediate and small components of electric motors	4	1.33	300	52410	251310	234869	101675	16441	7	4.78	934	231	0.4
tamping	3	1.33	250	43675	121022	121022	74247	-	-	2.77	540	163	0.59
echanical	4	1.33	300	52410	254573	237919	101675	16654	7	4.85	944	234	0.4
echanical processing of components for EP's order No 1	4	1.33	200	34940	135266	128787	67783	6439	-	3.87	755	190	0.5
				272532	1186731		540169			4.34	845	-	0.456
				time work				total No of rubles	% of wages				
		1.271	363	63416	157626	157626	131905	25721	19.5	2.48	496		0.84
rkers and piece workers										3.92	764		

	Shop Names		average category of labor	tariff rate for first category	number of piece-workers	man-hours of piece-work	Hourly fund (rubles)	Wages including piecework Total No of rubles	tariff rubles included	progressive piecework total No of rubles	% of piece-work earnings	average rubles per hour	wages rubles per month (195 hours)	fulfillment of the norms for work hours	share of the tariff in the average monthly wages
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Foundry Shop	(a) moulding (b) pivotal [sterzhnevoy]	4.5	1.43	180	31446	151032	146634	69495	4398	3	4.80	936	211	0.46
2	Forge Shop	stamping	5	1.43	30	5241	25893	25386	12264	507	2	4.93	962	207	0.47
3	Thermal Shop	heating	5	1.43	50	8735	42735	42104	20439	631	1.5	4.89	955	206	0.47
4	Mechanical Assembly Shop No 13	mechanical processing of components of electric motors	4.5	1.33	250	43675	204940	200922	92591	4018	2	4.68	914	217	0.45
5	Mechanical Shop No 25	mechanical processing of intermediate and small components of electric motors	4	1.33	300	52410	251310	234869	101675	16441	7	4.78	934	231	0.4
6	Mechanical Assembly Shop	stamping	3	1.33	250	43675	121022	121022	74247	-	-	2.77	540	163	0.59
7	Mechanical Assembly Shop No 15	mechanical	4	1.33	300	52410	254573	237919	101675	16654	7	4.85	944	234	0.4
8	Mechanical No 23	mechanical processing of components for MEP's order No 1	4	1.33	200	34940	135266	128787	67783	6439	-	3.87	755	190	0.5
For all shops						272532 time work	1186731		540169			4.34	845	-	0.456
Time workers				1.271	363	63416	157626	157626	131905	total No of rubles 25721	% of wages 19.5	2.48	496		0.84
All workers, time workers and piece workers												3.92	764		

Explanation of the Computation

Columns 2-3-4 are taken from the periodical Sotsialisticheskiy trud, No 10, 1956, page 10.

Column 5, the tariff rates in rubles for the first category, is taken from data introduced on page 3 of this report.

Column 6, the number of workers in the shops, is taken as a rough guide.

Column 7 is obtained by multiplying the number of workers by the real fund of working time (given on page 14 of this report), i.e., $\frac{269.24}{12} \times 7.8 = 174.7$ hours per month.

The average length of the working day is 7.8 hours.

Column 8, the hourly fund of wages in rubles (described on page 13 of this report).

Column 9, wages owed according to the piecework norms of output without bonuses or additional payments, are obtained by multiplying the average tariff coefficients by the average tariff rates of the first category (i.e., 2.21, 2.34, 2.13, 1.94, 1.7, 1.94, 1.94 for piece-workers and 2.08 for time workers) and then multiplying the result by the number of man-hours worked, taking into account the overfulfullment of the output norms, i.e., 211%, 207%, 206%, etc.

Column 10 is the same as column 9 but with only 100% fulfillment of the output norms.

Column 11, additional payments according to the progressive piecework system of payment of labor. The calculation is made in the following manner: 200% is taken as the base over which payments are

made according to the progressive piecework system.

$$\frac{211-200x100}{200} = 5.5\%$$

According to the table on page 9 of this report, we find that the piecework rate increases 50% for a 5.5% overfulfillment of the norm for that part above the base of 200%.

The amount of additional payments according to the progressive piecework system as a percentage of the total wages is computed for the accounting month in accordance with the piecework rates [naryady]:

$$M = \frac{211-200x50}{211} \cong 3\%$$

Column 12, percent of additional payments according to the progressive piecework system (calculation shown above).

Column 13 is obtained by dividing the hourly fund (Column 8) by the number of man-hours worked (Column 7).

Column 14 is obtained by multiplying the average hourly wages (Column 13) by 195 hours (the monthly fund of time).

Column 15 is taken from the periodical Sotsialisticheskiy Trud, No 10, 1956, page 10.

Column 16 is obtained by dividing column 10 by column 8.

The average hourly pay for all shops (column 13) is computed in the following manner:

$$\frac{180x100}{1560} = 12\% \qquad \frac{50 \times 100}{1560} = 3\%$$

$$\frac{30}{1566} x100 = 2\% \qquad \frac{250}{1560} \times 100 = 16\%, \text{ etc.}$$

$\frac{4.8x12+4.93x2+4.89x3+4.68x16+4.78x19+2.77x16+4.85x19+3.87x13}{100}$ = 4.34 rubles per hour

The calculation of the average wages of the time workers is done in the following manner.

The hourly rate of the first category is 127.1 kopeks (taken from table on page 4 of this report).

The average tariff coefficient = 1.64 (taken from the same table).

The average hourly wages according to the tariff = 1.271x1.64 = 2.08 rubles.

The number of time workers in the plant constitutes 23% of the total number of piece-workers, i.e., 1560 x 0.23 = 363 persons.

The number of man-hours worked in the time system is 363x174.7 = 63416 (as shown in Column 7).

The wages according to the tariff are 63416x2.08 = 131905 rubles (as shown in Column 10).

Bonuses are 19.5%. 131905 x 19.5 = 25721 [sic] rubles (as shown in Column 11).

131905 + 25721 = 157626 rubles (as shown in column 9).

The average hourly earnings = $\frac{157626}{63416}$ = 2 rubles 48 kopeks.

$$\frac{4.34x77+2.48x33}{100} = 3.92$$

The average monthly wages for all workers in the plant piece-workers and time workers, are 392 x 195 = 764 rubles.

As can be seen from the above calculations, the plant uses principally statistical norms based on output experience, which can be overfulfilled without difficulty by as much as even 230 or more percent. With this type of output norms in effect, the plants use, as a rule, special coefficients which regulate the average monthly pay.

These coefficients are also in use at the above plant. This can be seen by the fact that although mechanical shop No 23 fulfills its military orders, called MEP orders No 1 (Ministry of the Electrical Industry No 1), its overfulfillment of the output norms is 190%, i.e., less than all the other shops. Therefore this shop has a completely different form of pay. On the basis of this it can be said that no matter how one calculates the average wages of the workers in the USSR one does not obtain accurate data.

As further proof I calculated the average earnings for the same plant by another method. The data have been taken from the same source. The plants of the Ministry of the Electrical Industry usually use this method for calculating the average wages of their workers.

The calculation of the workers' average monthly wages in this method is based on the median figures [sredne-vzveshannyye velichinakh].

Calculation of the workers' average pay for the plant imeni Vladimir Il'yich of the Ministry of the Electrical Industry for September 1956.

Indexes	time workers	piece-workers	all workers
[1]	[2]	[3]	[4]
1. Average hourly rate of the first category in rubles	1.274	1.35	
2. Average tariff coefficient	1.64	1.47	
3. Average hourly earnings according to the tariff in rubles and kopeks	2.08	1.98	
4. Overfulfillment of the norm by piece-workers in %	-	210	
5. Additional payment included in the hourly wage fund in %	19.5	4.0	
6. Average hourly earnings in rubles and kopeks	2.48	4.33	3.90
7. Average length of the working day in hours			7.8
8. Additional payments included in the daily wage fund in %			2
9. Average daily earnings			31.02
10. Average length of the working month in days			22.4
11. Additional payments included in the monthly wage fund			10
12. Average wages			764

The data for this calculation are taken from the same sources as those for the first calculation of the average wages, so I will not repeat them a second time.

The calculation is performed in the following manner.

The average hourly rate of the first category of all piece-workers:

$$\frac{1.43x260+1.33x1300}{1560} = 1 \text{ ruble } 35 \text{ kopeks.}$$

The average tariff coefficient of piece-workers:

$$\frac{430x1.55+80x1.64+800x1.46+250x1.28}{1560} = 1.47$$

The hourly rate of the first time worker category is one ruble 27.4 kopeks.

The average tariff coefficient for time workers is 1.64.

The average hourly earnings according to the tariff for piece-workers:

$$1.35x1.47 = 1.984$$

for time workers:

$$1.274x1.64 = 2.08$$

The overfulfillment of the piecework norms in %:

$$\frac{180x211+30x207+50x206+250x217+300x231+250x163+300x234+200x190}{1560} = 210\%$$

The average hourly earnings in rubles for time workers:

$$2.08x0.195 = 0.405$$

$$2.08+0.405 = 2 \text{ rubles } 48 \text{ kopeks}$$

For piece-workers:

$$1.98x2.1 = 4 \text{ rubles } 16 \text{ kopeks}$$

Bonuses according to the progressive piecework system:

$$\frac{210}{(200x100)} - 100 = 3.4\%.$$

Using the scale for additional payments according to the progressive piecework system, let us take an 85% increase of additional earnings:

$$\frac{210-200x85}{210} = 4.065\%$$

4.16x0.04065 = 0.17 rubles

4.16+0.17 = 4 rubles 33 kopeks

Average hourly earnings of all workers, piece-workers and time workers:

$$\frac{2.48x23+4.33x77}{100} = 3 \text{ rubles } 90 \text{ kopeks}$$

Additional payments included in the daily wage fund of 2%:

3.90x0.02 = 0.078

3.90+0.078 = 3.978 rubles

Average daily wages:

3.978x7.8 = 31 rubles 02 kopeks

Additional payments included in the monthly wage fund of 10%:

$$\frac{31.02}{100} \times 10 = 3 \text{ rubles } 10 \text{ kopeks}$$

31.02+3.102 = 34 rubles 12 kopeks

Average monthly wages:

34.12x22.4 = 764 rubles.

As is seen from the above 2 variants of calculation of the average monthly wages, the data obtained are almost identical, but the average monthly wages obtained are higher than in actuality. Therefore both these variations can give correct results, but only if accurate accounting data is available. In our circumstances it is almost impossible to obtain such data since Soviet statistics carefully conceal them.

Consequently we must base our calculations on the data which are available to us which are published in the Soviet press and in technical literature.

For example Soviet statistics regularly furnish the following data on wages for individual plants and for ministries as a whole:

(a) tariff scales and tariff rates for the first category,

(b) what percentage of the general wages is composed of various additional payments and bonuses,

(c) what percentage of the general wages consists of payments according to the tariff.

These data are completely adequte for determining the average wages of a plant, branch, or ministry.

I propose the following system for calculation of the average monthly wages:

1. let us call the average monthly wages Z
2. let us call wages according to the tariff T
3. let us call all additional payments above the tariff earnings D

Then the average monthly wages would be

$$Z = T+D \qquad (1)$$

The most unpleasant and difficult part of this formula to calculate is the additional payments. However the Soviets often publish what part of the wages this is because it is even more unpleasant to them. Usually they will write that the additional payments in some plant or in the metallurgical or some other industry constitute 45% of the total average wages.

This can be expressed as

$D = 0.45$ let us call the coefficient 0.45 K

Then $D = KZ$ (2)

Let us substitute for D in formula (1)

$Z = T+KZ$ or

$Z-KZ = T$

$Z(1-K) = T$

$$Z = \frac{T}{1-K} \quad (3)$$

The coefficient "K" (i.e., the total of additional payments) in this formula is less than one if the additional payments do not exceed 100%. When they do exceed 100% Z is a negative number.

There is not a single unknown in this equation since the wages according to tariff T are derived from the handbooks, and the coefficient "K" is furnished by Soviet statistics.

Now let us consider the other possibility. Let us suppose that we have found out from Soviet statistics that in some branch or plant the wages according to the tariff constitute 50% of the total average wages,

i.e. $T = 0.5\ Z$; let us call 0.5 K

$T = KZ$ or

$$Z = \frac{T}{K} \quad (4)$$

To verify the effectiveness of this formula let us try to verify the average wages at the same Moscow plant, imeni Vladimir Il'yich, for which the above 2 variants of calculation have already been made.

The following data are furnished in the periodical Sotsialisticheskiy Trud No 10, 1956, pages 10-14.

This can be expressed as

$D = 0.45$ let us call the coefficient 0.45 K

Then $D = KZ$ (2)

Let us substitute for D in formula (1)

$Z = T+KZ$ or

$Z-KZ = T$

$Z(1-K) = T$

$$Z = \frac{T}{1-K} \quad (3)$$

The coefficient "K" (i.e., the total of additional payments) in this formula is less than one if the additional payments do not exceed 100%. When they do exceed 100% Z is a negative number.

There is not a single unknown in this equation since the wages according to tariff T are derived from the handbooks, and the coefficient "K" is furnished by Soviet statistics.

Now let us consider the other possibility. Let us suppose that we have found out from Soviet statistics that in some branch or plant the wages according to the tariff constitute 50% of the total average wages,

i.e. $T = 0.5\ Z$; let us call 0.5 K

$T = KZ$ or

$$Z = \frac{T}{K} \quad (4)$$

To verify the effectiveness of this formula let us try to verify the average wages at the same Moscow plant, imeni Vladimir Il'yich, for which the above 2 variants of calculation have already been made.

The following data are furnished in the periodical Sotsialisticheskiy Trud No 10, 1956, pages 10-14.

(1) Tariff payments constitute 46% of the average monthly wages of piece-workers and 71% of the average monthly wages of time workers.

There are 23% as many time workers as there are piece-workers.

Let us use these data to calculate the wages according to the tariff of the calculations given above.

	Time Workers	Piece-workers
1. Average hourly rate of the first category	1.274	1.35
2. Average tariff coefficient	1.64	1.47
3. Average hourly wages according to the tariff in rubles	2.08	1.98
4. Average monthly wages according to the tariff in rubles	3.64	3.47
6. Total average monthly earnings	512	754

Total average monthly earnings of all workers 698 rubles

There are 1560 piece-workers.

The average hourly earnings of piece-workers according to the tariff are

$$1.47 \times 1.35 = 1 \text{ ruble } 98 \text{ kopeks}$$

The average monthly wages of piece-workers according to the tariff are

$$1.98 \times 174.7 = 347 \text{ rubles}$$

According to the data furnished by the periodical Sotsialisticheskiy Trud, No 10, 1956, page 10, tariff earnings constitute 46% of piece-workers' wages. Using the formula (4) $Z=\frac{T}{K}$ we find

$$Z = \frac{347}{0.46} = 754 \text{ rubles.}$$

The average monthly wages of time workers according to the tariff = 174.7x2.08 = 364 rubles.

According to data furnished by the same periodical, tariff earnings constitute 71% of the time workers wages.

Therefore, according to formula (4)

$$Z = \frac{T}{K} \qquad Z = \frac{364}{0.71} = 512 \text{ rubles}$$

The average monthly earnings of all workers in the plant are

$$\frac{512x23+754x77}{100} = 698 \text{ rubles}$$

As we can see the use of this formula makes the calculation simpler and more convenient, and in addition furnishes more accurate results than the other methods of calculation.

New Tariff Conditions in Soviet Industry

By draft instructions of the Twentieth Congress of the KPSS on the Sixth Five-Year Plan for 1956-1960 it was determined to "establish correct relationships in the level of the tariff rates in the individual branches and professions, taking into consideration the qualifications of the workers and preferential pay for workers engaged in heavy labor and in high-temperature shops."

To carry out the decision of the Twentieth Congress of the KPSS, the Council of Ministers in 1956 began to conduct reforms of the existing tariff system.

To this end it was decided in 1956 to carry out a trial revision of the tariff system in 14 machine-building plants belonging to 14 different ministries. According to data furnished in technical literature, the Moscow plant imeni Vladimir Il'yich, which is subordinate to the Ministry of the Electrotechnical Industry, was among these 14 plants.

As a basis for introducing new tariff conditions the following conditions were laid down.

1. For workers employed in enterprises and in shops with one type of production and uniform working conditions, unified tariff scales would be introduced and unified qualification hand books independent of the subordination of the enterprise (Sovet. Prof. No 8, 1956, page 8).

2. Upon introducing new tariff conditions, a review would be conducted of existing norms at the enterprise (i.e., the output norms would be raised) and the largest possible number of technically based norms would be introduced.

1. The government forsees the increasing of the proportion of tariff rates up to 70-75% of piece-workers' pay instead of 40-55% at present, and up to 80-85% of time workers' pay as against 65-75% at present.

2. The number of tariff scales are to be cut to the minimum. (At present there are 1900 different tariff scales in all branches of industry and transport.) (Sotsialisticheskiy Trud No 1, 1957, pages 4-5.)

The Moscow Electric Machine-Building Plant imeni Vladimir Il'yich began to introduce new tariff conditions in September 1956. The old tariff scales at the plant were liquidated and a new tariff scale with 8 categories was introduced in which the relationship of the outer limits was 1:2.8.

	Tariff Categories							
	1	2	3	4	5	6	7	8
Tariff coefficients	1.0	1.15	1.32	1.52	1.77	2.06	2.04	2.8
Increase of tariff coefficients	-	0.15	0.17	0.20	0.25	0.29	0.34	0.4
Increase of tariff coefficients in %	-	15	14.7	15	16.5	16.7	16.5	16.7

The tariff rates were increased an average of 40%.

By the time new tariff conditions were introduced, as many as 65% of the norms of the plant had been put on a technical basis. However only 20% had been incorporated into production since a lowering of the general wage level was feared; and 16.5% of the workers were not able to fulfill their new output norms.

The following categories of piece-workers were transferred to time payments:

1. the mechanical-repair shop;
2. workers who repaired instruments;
3. transport workers;
4. bridge crane workers, sharpeners, and others.

The number of time workers was increased by 63%, i.e., time workers became 37% of the working force of the plant. Part of the time workers were transferred to a salaried system of pay. A tariff rate level 38% higher than the one that was in effect was chosen for the time workers.

A new bonus system was introduced for piece-workers and time workers.

The new bonus system applied only to those piece-workers for whom technically based norms or norms based on proven statistical experience were in effect.

The bonus amounted to as much as 20% of the entire piecework earnings if the monthly quota were fulfilled.

The bonus for time workers amounted to from 10 to 60% with the size of the bonus depending on the work conditions, the difficulty, volume, and responsibility of the work.

Indexes for awarding bonuses and the size of the bonus were worked out for each profession.

The share of the tariff in the average monthly workers' pay was increased from 46 to 65.3% for piece-workers, and from 71 to 85.7% for time workers.

The old tariff rates were abolished and the following 4 tariff rates were introduced.

(See Table on Page 34)

During 1956 and 1957, in accordance with a decision of the government the introduction of new tariff conditions has been taking place, beginning with the metallurgical, machine-building, and cement industries.

Instead of the huge number of tariff scales and rates -- in the enterprises only of machine-building ministries are more than 800 tariff scales and 900 tariff rates in effect -- it is planned to establish several rates for piece-workers of the first category of each branch, taking into consideration work conditions and the importance of individual branches to the economy.

Let us try to calculate the average wages of the plant imeni Vladimir Il'yich according to the new tariff conditions; the calculation will be done by the method proposed by me.

HOURLY RATES

Categories	Tariff Coefficients	PIECE-WORKERS			TIME WORKERS	
		in low temperature work	in heavy labor and work in unhealthy conditions	in extremely heavy labor and extremely unhealthy work conditions	in low temperature work	in heavy hot labor and work in unhealthy conditions
1	1.0	1-78	2-10	2-40	1-50	1-78
2	1.15	2-04.7	2-41.5	2-67.6	1-72.5	2-04.7
3	1.32	2-35	2-77.2	3-16.8	1-98	2-35
4	1.52	2-70.6	3-19.2	3-64.8	2-28	2-70.6
5	1.77	3-15.1	3-71.7	2-24.8	2-65.5	3-15.1
6	2.06	3-66.7	4-34.6	4-94.4	3-09	3-66.7
7	2.4	4-27.2	5-04	5-76	3-60	4-27.2
8	2.8	4-98.4	5-88	6-72	4-20	4-98.4

Calculation of the average monthly wages in the plant imeni Vladimir Il'yich of the MEP, according to the new tariff conditions, using the proposed method:

Indexes	Time Workers	Piece Workers	All Workers
1. Average hourly rate of the first category in rubles	1.56	1.86	
2. Average tariff coefficient	1.52	1.55	
3. Average hourly wages according to the tariff in rubles	2.38	2.87	
4. Average monthly wages according to the tariff in rubles	414	504	
5. Total average monthly wages in rubles	482	770	683

Let us go through the calculation of the average monthly wages at the plant imeni Vladimir Il'yich according to the new tariff conditions introduced in the plant in September 1956.

There are 1560 piece-workers in the plant and 920 time workers.

Time workers constitute 37% of all piece-workers used for the calculation.

As a rule approximately 20% of the time workers are employed in high temperature work.

i.e. $\frac{920}{100} \times 20 = 184$ workers

The average hourly rate for time workers of the first category would be

$$\frac{20 \times 1.78 + 80 \times 1.5}{100} = 1.56$$

The average category of time workers is equal to 4

The average tariff coefficient for time workers -- 1.52

The average hourly earnings of time workers according to the tariff = 1.52 x 1.56 = 2 rubles 38 kopeks.

The average monthly wages of time workers according to tariff = 1.74x2.38 = 414 rubles.

The total monthly wages of time workers would be equal to

$Z = \frac{T}{K}$; K = 0.857 taken from the same periodical

$Z = \frac{414}{0.857} = 482$ rubles

There are 1560 piece-workers.

The number of piece-workers engaged in high temperature work is 260.

The average hourly rate of the first category would be equal to

$$\frac{260x2.10+1300x1.78}{1560} = \frac{2860}{1560} = 1.86 \text{ rubles}$$

The average tariff coefficient for piece-workers would be equal to

$$\frac{260x1.77+800x1.52+250x1.64+250x1.32}{1560} = \frac{2416}{1560} = 1.55$$

The average hourly earnings of piece-workers according to the tariff are 1.55x1.86 = 2 rubles 87 kopeks.

The average monthly wages of piece-workers according to the tariff are 2.87x174.7 = 504 rubles.

The total average monthly wages of piece-workers would be

$Z = \frac{T}{K}$ K = 0.653 according to data from the same periodical

$Z = \frac{504}{0.653} = 770$ rubles

The average monthly wages of all workers at the plant are

$$\frac{482 \times 37 + 770 \times 63}{100} = 683 \text{ rubles.}$$

When the total of additional payments above the tariff earnings is known as a %, the calculation of the average wages can be done using formula (3), page 28, which furnishes results as accurate as those of formula (4) page 28. Let us illustrate this using as an example the last variant of calculation of the average wages in the plant imeni Vladimir Il'yich under the new tariff conditions.

The average monthly wages of time workers according to the tariff: T = 414 rubles.

The percentage of additional payments = 14.3%

The total average monthly wages for time workers would be equal to

$$Z = \frac{T}{1-K} = \frac{414}{1-0.143} = 482 \text{ rubles}$$

The average monthly wages of piece workers according to the tariff: T = 504 rubles.

The percentage of additional payments = 34.7%

$$Z = \frac{504}{1-0.347} = 770 \text{ rubles.}$$

Therefore we can conclude from the data of the calculation that the calculation of the average monthly wages is considerably easier and more accurate when done using the proposed formulas. When using this method one cannot make any mistakes in calculating the total amount of additional payments since it is obtained from Soviet statistics. If one wishes to break down the total amount of additional payments into its components, this may be done by using either of the 2 variants of calculation. Using the above formulas it is possible to calculate the average

monthly wages for all branches and all the ministries of Soviet industry and even for the entire industry of the USSR.

Since I was given the assignment of calculating only the average monthly wages in the Ministry of the Electrotechnical Industry, I am furnishing only the necessary data for calculating the average wages for several branches of industry and for the entire industry of the USSR which you may make use of in further calculations.

Name of Ministry	Percentage of tariff in average monthly wages		
	Time Workers	Piece-Workers	All Workers
1	2	3	4
Ministry of Transport Machine Building	28.3%	51%	50.7%
Ministry of Heavy Machine Building	61%	50%	
Ministry of Ferrous Metallurgy	-	58%	62.8%
Ministry of General Machine Building	63%	43.6%	-
Ministry of the Electrical Industry	85.7%	66.9%	according to new tariff conditions
	0.70%	44%	according to old tariff conditions
The Entire Industry of the USSR	65-75%	40-55%	-

These data were taken from the periodical Sotsialisticheskiy Trud No 1, 1957, No 11, 1956, and No 10, 1956.

What conclusions can be drawn from the calculations that have been made of the average wages? According to the first and second variants of calculation the average wages of all the workers in the plant imeni Vladimir Il'yich are 764 rubles.

The amount obtained by both calculations was identical because just as the various down payments were identical, so were the other components of the calculations. The only difference was in the method of calculation. I believe that the estimated average monthly wages of 764 rubles are higher than the actual amount. This is because the exact amounts of additional payments, both those for the progressive system and other types, are not known. These estimates were furnished by me from my past experience in plants of the same category as the plant imeni Vladimir Il'yich.

Moreover the accounting data furnished in the periodical Sotsialisticheskiy Trud, No 10, 1956, on the overfulfillment of the norms from 190-234% seem exaggerated.

The plant furnished these data only for the leading shops. The result of the calculation may also have been affected by the fact that not all workers in the plant were used for the calculation but only a part of them. The true average monthly wages for workers in the plant imeni Vladimir Il'yich must therefore be 698 rubles, the amount obtained by the proposed method. One is easily convinced of this by comparing all the methods of calculation.

Therefore on 1 September 1956 the average monthly wages of workers at that plant were 698 rubles.

On 1 January 1957 the average monthly wages under the new tariff system became 683 rubles.

Calculation of the Average Monthly Wages in the Ministry of the Electrical Industry

The calculation will be done separately by branches of the industry. The new tariff conditions will be used as a basis for the calculation.

Consequently the wage data obtained will be for the beginning of 1957.

Calculation of the average monthly wages in the cable industry is given below.

	Time Workers	Piece-Workers	All Workers
1. Average tariff coefficient	1.36		1.36
2. Average hourly rate of the first category in rubles	1.57		1.86
3. Average hourly earnings according to the tariff in rubles	2.13		2.53
4. Average monthly wages according to the tariff in rubles	372		442
5. The share of the tariff in the average monthly wages in rubles	0.85	0.745	
6. Average monthly wages in rubles	436	594	534 rubles

1. Average tariff coefficient.

Since in the cable industry of the USSR manual and unskilled labor predominate, the average category of labor of all workers is equal to 3.2.

Using the table on page 32 we find that the average tariff coefficient of all workers is equal to 1.36.

The average hourly rate of the first category.

(a) In the cable industry approximately 25% of all workers are employed in unhealthy and heavy labor.

(b) Time workers constitute approximately 40%.

From the table on page 34 we find:

The average hourly rate of the first category of time workers

$$\frac{25 \times 1.78 + 75 \times 1.5}{100} = 1.57 \text{ rubles}$$

The average hourly earnings of time workers

$$1.57 \times 1.36 = 2.13 \text{ rubles}$$

The average monthly tariff wages of time workers

$$174.7 \times 2.13 = 372 \text{ rubles}$$

The total average monthly wages

$$Z = \frac{T}{K} = \frac{372}{0.85} = 436$$

The average hourly rate of the first category of piece-workers.

From the table on page 32 we find

$$\frac{25 \times 2.10 + 75 \times 1.78}{100} = 1.86 \text{ rubles}$$

The average hourly earnings of piece-workers.

$$1.86 \times 1.36 = 2.53 \text{ rubles}$$

The average monthly tariff wages of piece-workers

$$174.7 \times 2.53 = 442 \text{ rubles}$$

$$Z = \frac{T}{K} = \frac{442}{0.745} = 594$$

The average monthly wages of all workers in the cable industry

$$\frac{436 \times 40 + 594 \quad 60}{100} = 534 \text{ rubles}$$

Wages in the accumulator and insulation industries may be considered as comparable to those of the cable industry since their work conditions are approximately the same.

From the table on page 34 we find:

The average hourly rate of the first category of time workers

$$\frac{25 \times 1.78 + 75 \times 1.5}{100} = 1.57 \text{ rubles}$$

The average hourly earnings of time workers

$$1.57 \times 1.36 = 2.13 \text{ rubles}$$

The average monthly tariff wages of time workers

$$174.7 \times 2.13 = 372 \text{ rubles}$$

The total average monthly wages

$$Z = \frac{T}{K} = \frac{372}{0.85} = 436$$

The average hourly rate of the first category of piece-workers.

From the table on page 32 we find

$$\frac{25 \times 2.10 + 75 \times 1.78}{100} = 1.86 \text{ rubles}$$

The average hourly earnings of piece-workers.

$$1.86 \times 1.36 = 2.53 \text{ rubles}$$

The average monthly tariff wages of piece-workers

$$174.7 \times 2.53 = 442 \text{ rubles}$$

$$Z = \frac{T}{K} = \frac{442}{0.745} = 594$$

The average monthly wages of all workers in the cable industry

$$\frac{436 \times 40 + 594 \quad 60}{100} = 534 \text{ rubles}$$

Wages in the accumulator and insulation industries may be considered as comparable to those of the cable industry since their work conditions are approximately the same.

Calculation of the average monthly wages for the machinery branch [apparatnaya otrasl'] and electrical instruments [elektropribory].

	Time Workers	Piece-Workers	All Workers
1. Average tariff coefficient	1.67	1.67	1.67
2. Average hourly rate of the first category in rubles	1.52	1.79	1.732
3. Average hourly earnings according to the tariff in rubles	2.54	2.99	
4. Average monthly wages according to the tariff in rubles	443	524	
5. The share of the tariff in the average monthly wages in rubles	0.86	0.67	
6. Average monthly wages	514	780	727

1. Average tariff coefficient.

The average category of labor in machinery and electrical instrument building is approximately 4.6

From the table on page 32 we find that the average tariff coefficient of all workers = 1.67

From the table on page 34 we find that the average hourly rate of the first category of piece-workers = 1.79

Of time workers = 1.52

Time workers constitute about 20%

The average hourly earnings according to the tariff of piece-workers

1.79 x 1.67 = 2.99 rubles

Of time workers

1.52 x 1.67 = 2.54 rubles

The average monthly wages of piece-workers according to the tariff

2.99x174.7 = 524 rubles

Of time workers

174.7x2.54 = 443 rubles

Total average monthly wages of piece-workers

$$Z = \frac{T}{K} = \frac{524}{0.67} = 780 \text{ rubles}$$

Of time workers

$$\frac{443}{0.86} = 514 \text{ rubles}$$

The average monthly wages of all workers =

$$\frac{514x20+780x80}{100} = 727 \text{ rubles}$$

The wages of the workers in the electronics industry may be considered comparable to those of the workers in the machinery branch and electrical instruments branch since there is practically no difference in the pay of these categories of workers.

In order to calculate the average monthly wages of the workers of the entire Ministry of the Electrical Industry, it is necessary to estimate the relative weight of each branch in relation to the entire industry of the Ministry.

Name of the Branch of the Industry	Relative Weight in the Industry of the Ministry in % (approximate)
1. Electrical Machine Building	61
2. Cable Industry	12
3. Machinery and Instrument Building	25
4. Accumulator Industry	2

Therefore the average monthly wages of workers in the Ministry of the Electrical Industry at the beginning of 1957 would be:

683x61+534x12+727x25+534x2 = 660 rubles

The average monthly wages in the entire ministry under the old tariff conditions in September 1956 were approximately 700 rubles, i.e., when the new tariff conditions were introduced the output norms were raised and the piecework rates lowered. This lowered the general wages approximately 6%.

Therefore the average wages in the branches of the Ministry of the Electrical Industry in January 1957 would be as follows:

Branches of the Industry	Average Monthly Wages
1. Electrical Machine Building	683 rubles
2. Electrical Instrument Building	727 rubles
3. Electrical Machinery Building [Elektroapparatostroyeniye]	727 rubles
4. Electronics Industry	727 rubles
5. Cable Industry	534 rubles
6. Insulation Industry	534 rubles
7. Accumulator Industry	534 rubles
Average monthly wages for the entire ministry at the beginning of 1957	660 rubles
Average monthly wages for the entire ministry of the Electrical Industry in 1956	700 rubles

SUBJECT II. PRODUCTIVE FACTOR RELATIONSHIP

The given problem is extremely difficult because I was not able to find relevant material in the Library of Congress. The reason is that all technical literature on the electrical industry has been removed from general circulation.

In the plants of the Ministry of the Electrical Industry a large number of technical coefficients are in effect whose purpose is to control the economic activities of each enterprise. These coefficients establish quantitative criteria for the expedient use of basic resources allocated to the enterprise for the fulfillment of the plan. Control of the use of the resources of an enterprise is the main task of the management and administrative apparatus of that enterprise.

Norms or coefficients are usually established for the different types of basic resources, such as:

1. production;
2. labor and wages;
3. use of basic resources;
4. material and technical supplies;
5. use of fuel and electricity;
6. cost of production.

1. The following coefficients are used in estimating the fulfillment of the production program:

(1) percentage of fulfillment of the production plan in financial or natural terms or in norm-hours [normochasy];

(2) expenditure of labor on individual products, expressed in norm-hours;

(3) loss of working time expressed in norm-hours or man-days;

(4) use of overtime work as percent of general working time;

(5) defective production as a percent of the cost of the plant's gross output;

(6) regularity of production [ritmichnost' vypuska produktsii].

In order to control the regularity of production during the year, the output of goods is summarized by 10-day periods -- the first, second, and third 10-day periods of each month.

2. The following coefficients are used in estimating (the fulfillment of) the labor plan:

(1) the average number of personnel registered;

(2) the average output per worker, per month, quarter, and year, in rubles;

(3) the average wages per month, quarter, and year in rubles;

(4) fulfillment of the production norms in %;

(5) bonuses and additional payments expressed as a percentage of general wages.

3. The following coefficients are used in evaluating the use of the basic resources:

(1) coefficient for the use of equipment, which is defined as the relationship between the number of machine-hours actually worked to the scheduled fund of time;

(2) planned output per machine-hour for one sq m of production area and for one ruble of basic resources;

(3) stoppage of equipment expressed as % of all scheduled time.

4. The following coefficients are used in evaluating material and technical supplies:

(1) the receipt of material in kg by months and quarters;

(2) the types of materials supplied, i.e., supervision of the various different materials received;

(3) exponditure of material per article in kg.

5. Use of fuel and electricity.

Here the specific norms for expenditure of fuel and electricity are used.

The above enumerated norms are not identical for all enterprises of the Ministry of the Electrical Industry.

The exact size of these coefficients depends on many factors, such as:

(a) the type of enterprise;

(b) the nomenclature of articles produced by the enterprise;

(c) the capacity of the enterprise;

(d) the territorial location of the enterprise;

(e) the technical equipment of the enterprise;

(f) the mechanization of technological processes, etc.

Consequently there are great variations in these coefficients within the Ministry of the Electrical Industry. These variations are especially great between the different branches of the industry of the ministry. For example there is a great difference in the absolute size of the coefficients between the electrical machine-building industry and the cable industry, and between the cable industry and the electronics industry or the electrical machinery industry.

I was unable to find any Soviet technical literature which would enable me to determine the actual size of the coefficients enumerated above. Therefore I will describe the variation of the coefficients only

for the electrical machine building industry alone since it is more familiar to me than the other branches and I can furnish the coefficients on the basis of actual experience.

1. Production

(1) The fulfillment of the production plan is expressed in percent separately for gross production and net production. The percent of fulfillment varies greatly from 65% to 150%.

(2) The labor expenditure for large products is given separately for each article in norm-hours. The labor expenditure for small articles is given by groups.

(3) The loss of working time is expressed as a percentage of the basic real fund of working time or planned fund of working time and varies from 8-15%.

(4) The percentage of overtime work varies from 4 to 8%.

(5) Stoppage of production varies from 15 to 6%. In foundry shops however it varies from 10 to 20%.

(6) Regularity of production.

According to orders issued by the ministry the output of the machine building plants for each 10 days of the month should be in the following proportions.

First 10 days	Second 10 days	Third 10 days	for the month
in %	in %	in %	in %
30	30	40	100

In actuality the output for each 10 days is in the following proportions.

First 10 days	Second 10 days	Third 10 days	For the month
in %	in %	in %	in %
10	20	70	100

2. Labor and Wages

(a) Number of engineers, technicians, and white-collar workers per 100 production workers -- from 50 to 60

(b) Number of piece-workers in % -- 60-70%

(c) Number of time workers in % -- 30-40%

(d) Average category of piece-workers -- 4.2-4.5

(e) Average category of time workers -- 3.5-5

1. Average monthly output per worker in rubles -- from 3,000 to 5,500 rubles

2. Average monthly wages per worker -- 680-690

3. Percentage of fulfillment of the norms by piece-workers -- 100-170%

4. Bonuses and additional payments above the monthly tariff rates as a percentage of the total wages of time workers -- 15-30%

5. Bonuses and additional payments above the monthly tariff rates as a percentage of the total wages of piece-workers -- 30-55%

3. Use of Basic Resources

(1) Average coefficient of use of all machinery -- 0.65-0.85

This coefficient varies greatly.

For example:

for hydraulic presses -- 0.3-0.5

for large crank presses -- 0.4-0.5

for forge-press equipment -- 0.2-0.45

(2) Expenditure of machine-hours per one ruble of gross production at fixed prices 0.05-0.06

(3) Expenditure of working time in man-hours per 1,000 rubles of production 35. - 58

(4) Coefficient of replacement of equipment 1.3-1.6

(5) Stoppages of equipment as % of all scheduled time 10-15%

4. Material and Technical Supplies

1. Expenditure of materials as a percentage of total production expenses 50-60

5. Fuel and Electricity

1. Specific expenditure of fuel = $\frac{\text{standard fuel}}{\text{production in natural form}}$

I do not remember the data

2. Specific expenditure of electricity = $\frac{\text{electricity in kwh}}{\text{production in natural form}}$

I do not remember the data.

6. Cost of Production

The structure of the cost of electrical machine building is shown approximately by the following data.

Wages with extra charges in %	Materials in %	Fuel and electricity as included in materials	Amortization	Other Expenditures
38%	52	3.8	2.5	7.5

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Technical standardization and the theory of metal cutting are summarized well in this book. The method for working out the standards for manual labor, the work of fitters, assembly fitters, winders, and others is given. Only the theoretical principles for the organization of wages are given.

Shortcomings of the Book

In this book the theoretical problems of the organization of wages and the methods of conducting various calculations in regard to wages are summarized. Practical wage indexes are completely absent.

This book cannot serve as a handbook on wages. It can serve as a textbook for defining the basic terminology in the field of wages.

This book is valued in the library only because it is the only book in which the problems of wages in the electrical industry are discussed to some degree.

Chislennost' i zarabotnaya plata rabochikh i sluzhashchikh v SSSR [The Number of Workers and White-Collar Workers in the USSR and Their Wages].

Itogi yedinovremennogo ucheta za mart 1936 goda [Results of a Single Calculation in March 1936], ND 8521 A5, 1936.

Data are given on the number of workers and their wages for the entire heavy industry as a whole. It is impossible to make use of

this book at present because the organization of industry has greatly changed and the administrative division of the country into rayons is now completely different.

Maslova, N. S., Zarabotnaya plata, kak faktor rosta proizvoditel'nosti truda v promyshlennosti [Wages as a Factor in the Growth of Labor Productivity in industry], ND 5046, M35, 1952, Zdaniye.

In general, this book is pure propaganda in character, and extols the advantages of the socialist system. In particular, there are some comparative data on the productivity of labor in metallurgy. Similar data to those furnished by N. S. Maslova can be found in greater quantity in other Soviet technical sources.

N. S. Maslova appears to be the propagandist of the industrial section of the Central Committee of the KPSS. Consequently all her books are more of propaganda than factual in character.

Voronkov, I. I., Organizatsiya truda i zarabotnoy platy na mashinostroitel'nom zavode, TJ 1135, V6, 1955, Mashgiz, 215 pages.

This book is of great value because it contains a considerable amount of valuable technical data, not only on wages but also on the organization of wages and on technical standardization.

In the majority of his calculations and examples, the author uses actual data from the experience of machine builders in the Urals. This book can serve as a useful textbook and handbook on wages in the machine building branch.

Radishevskiy, A. A., Spravochnik po zarabotnoy plate [Handbook on Wages], 1939, Moscow, Prodoizdat.

This handbook contains the basic government decrees on wages published up to 1939. The majority of these decrees are in effect at the present time. Therefore this handbook may also be of use as a reference for these decrees.

Spravochnik po trudu i zarabotnoy plate na elektrostantsiyakh, v setyakh i na zavodakh Ministerstva Elektrostantsiy [Handbook on Labor and Wages in Electric Stations, Grids, and in Plants of the Ministry of Electric Stations], HD 4966, E42 R8, 1946, Leningrad, Gosenergoizdat, 268 pages.

All the basic data on wages in the Ministry of Electric Stations are furnished in this handbook. Until newer data on wages are offered in Soviet technical literature, this handbook is the only one which can possibly be used as a textbook.

Konakov, D. M., Organizatsiya zarabotnoy platy i normirovaniya truda v promyshlennosti SSSR [Organization of Wages and Standardization of Labor in the Industry of the USSR], HD 5046, K59, 1953, Gospolitizdat.

This book contains several useful figures on wages in individual branches of industry. The contents of the book are more of propaganda than factual in character.

Differentsiatsiya zarabotnoy platy v fabrichno-zavodskoy promyshlennosti soyuza SSR za 1927-1929 g. g. [Differentiation of Wages in the Factory -- Plant Industry of the USSR from 1927 to 1929], 1929, Moscow, statisticheskoye izdatel'stvo Ts. S. U. SSSR.

In this handbook interesting data on wages of workers and white-collar workers from 1927 to 1929 are brought forward.

Boltyanskiy, A., Voprosy sotsialisticheskoy organizatsii truda i zarplaty v potochnom proizvodstve [Problems of Socialist Organization of Labor and Wages in Mass Production], HD 2356 Rg B6, 1953.

The author treats the problems of organization of labor and wages fairly well, but only in mass production.

Gal'tsov, A. D., Tekhnicheskoye normirovaniye truda na promyshlennom predpriyatii [Technical Standardization of Labor in an Industrial Enterprise], T 58, G 28, 1956.

This book may serve as a good theoretical textbook for studying the theory of technical standardization in machine building.

Spravochnik Profrabotnika, HD 6733 V8-1930, Moscow, izdatel'stvo VTsSPS.

This handbook contains interesting data on tariff and economic questions. This handbook may be of interest when the tariff system, i.e., the wage system of workers in the USSR in the 1930's is being studied.

Spravochnik po voprosam oplaty truda [Handbook on Wage Problems], HD 5046 A5, 1949, Vladivostok.

This handbook contains valuable data on wages in the fish industry.

Manevich, Ye. L., Zarabotnaya plata i yeye formy v promyshlennosti SSSR [Wages and Their Forms in the Industry of the USSR], HD 5046 M3.

This book is very well written. It contains useful data on wages in Soviet industry. The author discusses to some extent the theoretical problems of organization of wages in industry.

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This collection contains the basic decrees and orders of the Soviet government on labor and wages issued up to 1946.

Blizhevskiy, A., Spravochnik po normirovaniyu [Handbook on Standardization], TJ 1143, B45, 1955.

This handbook contains good material on the standardization of labor in the industry of the USSR.

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Lyapin, A. P., Raspredeleniye po trudu ekonomicheskiy zakon sotsializma [The Distribution of Labor is the Economic Law of Socialism], HB 301, L4, 1949, Moscow, Izdatel'stvo "Pravda."

This book is pure propaganda.

Konakov, D., Zarabotnaya plata i yeye formy v promyshlennosti [Wages and Their Forms in Industry], HD 5046 K6, 1949, Moscow.

This book was written as propaganda and not to furnish facts.

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